Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

$$T=t_1+t_2=\sqrt{\frac{2x}{g}}+\sqrt{\frac{2}{g}}[e\sqrt{x}\pm\sqrt{(e^2x-a)}].$$

Putting $dT/dx=0$, we get $x=\dfrac{a(1+e)^2}{e^2(1+2e)}$.

Also solved by C. N. Schmall, and H. Prime. In their solutions, these gentlemen use $e=1$.

324. Proposed by V. M. SPUNAR, Chicago, Ill.

A parabola slides between two rectangular axes; find (a) the locus of the focus, and (b) the locus of the vertex.

I. Solution by ELIJAH SWIFT, Princeton University.

Take the parabola in the form $y^2=4ax$. The equation of any two perpendicular tangents may be written $y=mx+(a/m)$ and $y=-(1/m)x-am$. The distances of these from the focus are $Y=(a/m)\sqrt{(1+m^2)}$ and $X=a\sqrt{(1+m^2)}$, and these quantities would therefore be the coördinates of the focus of a moving parabola, if the two perpendicular tangents were axes. Eliminating m, we get as the locus

$$x^2y^2=a^2(x^2+y^2), \text{ or in polar coördinates, } r=\frac{2a}{\sin 2\phi}.$$

In case (b), $Y=\dfrac{a}{m\sqrt{(1+m^2)}}$, $X=\dfrac{am^2}{\sqrt{(1+m^2)}}$.
Elimination of m gives us $x^2y^2(x^{\frac{2}{3}}+y^{\frac{2}{3}})^3=a^6$.

261. Proposed by V. M. SPUNAR, M. and E. E., Chicago, Ill.

A man six feet high, walking at a rate of 100 yards a minute, crosses a muddy road close behind a wheel of a carriage which is going thrice as fast and in a direction at right angles to that of the man's motion. The diameter of the wheel is five feet. If, when the man is four feet from the middle of the wheel the mud is splashed up to the hight of seven feet, will any of it touch him? Unsolved in *Educational Times.*

Solution by H. PRIME, Boston, Massachusetts.

Let ϕ be the angle of elevation, v the velocity, of particles of mud leaving the ground at A; let the line ABH be the path of the wheel, $DEFGHI$ the man's path, the man being at D when the wheel touches A, at F when it touches B, and the mud is 7 feet high. Then $BF=4$ feet, $BH=3FH-\frac{5}{2}$, $16-FH^2=(3FH-\frac{5}{2})^2$, $FH=1.989960$, $BH=3.469879$.

The man is at three critical points in his path,—at E when the mud is 6 feet high rising, at G when it is 6 feet high falling, at I when the mud is striking the ground. While the man is between E and G, no mud can touch him, for it is more than 6 feet high. Between D and E only rising mud can hit him, between G and I only falling mud.